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BULLETIN NO.:

July 1961

Advanced Communications Sales
18 Ames Street
Cambridge 42, Massachusetts

VOICE INTERFERENCE ANALYSIS SET

Type 261

PURPOSE

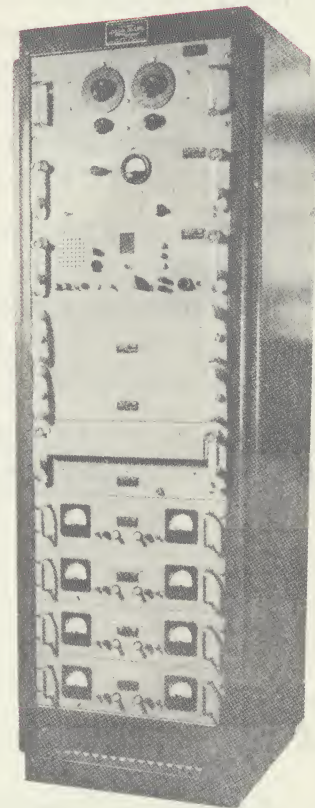
The Voice Interference Analysis Set was developed specifically to perform rapid, accurate evaluation of all forms of voice communication channels in the presence of various types of interference. The Analysis Set is designed to take into account not only the characteristics of the communication channel and the existing interference, but also the characteristics of an average talker and listener. The Voice Interference Analysis Set may be used with any channel normally used for speech, regardless of transmission distance and time delay or remoteness of input and output ends of the channel. No form of clear reference channel is required.

DESCRIPTION

The Voice Interference Analysis Set consists of a six-foot rack of equipment weighing approximately 500 pounds, and a nineteen-inch panel sub-unit which weighs approximately 80 pounds. The upper section of the main unit is occupied by the analysis circuitry with the lower portion holding power supply units used by the equipment.

The sub-unit generates a specially-modulated tone which is fed into the input of the communication channel. This unit is normally located at the input or transmission site.

The main rack of the Analysis Set contains transducer response simulation circuitry, an automatic gain control system, spectrum dividing filter bank, interference



measuring detectors, log taking-summing-integrating circuitry, and analog-to-digital converter. In addition, control, timing, readout, and monitor circuits are contained in the main unit.

The main unit power requirement is approximately 1800 watts at 115 volts, 60 cps, single phase AC. The sub-unit power is approximately 150 watts at 115 volts, 60 cps, single phase AC.

OPERATION

In operation, a triangularly modulated audio tone is generated and supplied to the input of the communication channel under test. This tone is transmitted through the channel under test and the resulting channel output is fed into the input of the Voice Interference Analysis Set. The resulting signal, tone and interference, is normalized in level and separated into fourteen frequency bands. Each band has its level corrected in accordance with speech spectral distribution, and is detected to obtain a measurement of interference in each band. The logarithms of the detector outputs are summed and integrated for a precisely timed interval, with the integration result becoming an analog representation of the channel score in terms of Articulation Index. The analog is converted to digital form for front panel presentation and to a 20-part digital output for recording purposes.

The Voice Interference Analysis Set completes an analysis and readout cycle in less than 30 seconds, producing data having repeatability and accuracy previously obtained through the services of from 10 to 20 individuals for 15 minutes in listener tests. Test results are produced at excellent repeatability (better than 5%), and exhibit good correspondence to basic theory (see references below).

Extreme care was given to systems engineering in the development of the Analysis Set, resulting in a well integrated unit, capable of long term stability and accuracy.

REFERENCES

1. Journal of Speech and Hearing Disorders, Monograph Supplement 1, "The Effects of Noise on Man", September 1950.
2. Miller, G. A. and Licklider, J. C. R., "The Intelligibility of Interrupted Speech", J. Acoust. Soc. Am 22, 167-173 (1950).



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